

Listing of Claims

1. (Currently Amended) A docking assembly connected to a movable subject couch ~~(30)~~ for docking a movable subject couch ~~(30)~~ with an imaging apparatus ~~(10)~~, the docking assembly including:

couch alignment surfaces ~~(72)~~ that mate with corresponding imaging apparatus alignment surfaces ~~(64)~~ of a connecting region ~~(50)~~ of the imaging apparatus ~~(10)~~ to define a docked position of the movable subject couch ~~(30)~~ with respect to the imaging apparatus ~~(10)~~;

a docking sensor ~~(160)~~ that detects the movable subject couch ~~(30)~~ approaching the docked position;

a latch ~~(82)~~ that mates with the connecting region ~~(50)~~ of the imaging apparatus ~~(10)~~; and

an actuator ~~(130, 154)~~ that cooperates with the latch ~~(82)~~ to bias the movable subject couch ~~(30)~~ into the docked position in response to the docking sensor ~~(160)~~ detecting that the couch ~~(30)~~ has approached the docking position.

2. (Currently Amended) The docking assembly as set forth in claim 1, further including:

rolling elements ~~(74)~~ arranged between the couch alignment surfaces ~~(72)~~ and the corresponding imaging apparatus alignment surfaces ~~(64)~~ of the connecting region ~~(50)~~ of the imaging apparatus ~~(10)~~.

3. (Currently Amended) The docking assembly as set forth in claim 1, wherein the docking assembly further includes:

couch camming surfaces ~~(62)~~ that cooperate with camming surfaces ~~(74)~~ of the connecting region ~~(50)~~ of the imaging apparatus ~~(10)~~ to cam the movable subject couch ~~(30)~~ laterally toward alignment with the docked position as the movable subject couch ~~(30)~~ approaches the imaging apparatus ~~(10)~~.

4. (Currently Amended) The docking assembly as set forth in claim 1, wherein the latch ~~(82)~~ includes:

a biasing spring ~~(88)~~; and

a hook ~~(86)~~ that is biased by the biasing spring ~~(88)~~ toward a closed position, the hook ~~(86)~~ being cammed opened in opposition to the biasing spring ~~(88)~~ by a camming surface ~~(56)~~ of a latch block ~~(52)~~ as the movable subject couch ~~(30)~~ approaches the docked position, the biasing spring ~~(88)~~ biasing the hook ~~(86)~~ to close onto the latch block ~~(52)~~ as the hook ~~(86)~~ moves past the camming surface ~~(56)~~ and ceases contact therewith.

5. (Currently Amended) The docking assembly as set forth in claim 1, wherein the actuator ~~(130, 154)~~ includes:

an electric motor ~~(154)~~; and

a mechanical energy storage element ~~(130)~~ interposed between the motor ~~(154)~~ and the latch ~~(82)~~, the mechanical energy storage element ~~(130)~~ cooperating with the latch ~~(82)~~ to bias the movable subject couch into the docked position when the motor ~~(154)~~ is not delivering mechanical energy.

6. (Currently Amended) The docking assembly as set forth in claim 5, wherein the mechanical energy storage element ~~(130)~~ includes a spring ~~(130)~~ interposed between the motor ~~(154)~~ and the latch ~~(82)~~.

7. (Currently Amended) The docking assembly as set forth in claim 6, wherein the actuator ~~(130, 154)~~ further includes:

a drive shaft ~~(120, 134, 146)~~ arranged between the motor ~~(154)~~ and the latch ~~(82)~~, the motor ~~(154)~~ driving the drive shaft ~~(120, 134, 146)~~ in a first direction to secure the latch ~~(82)~~ onto the latch block ~~(52)~~ of the connecting region ~~(50)~~ of the imaging apparatus ~~(10)~~, the spring ~~(130)~~ storing energy received from the motor ~~(154)~~ during the driving in the first direction, the stored energy continuing to bias the latch ~~(82)~~ on the latch block ~~(52)~~ after the driving in the first direction ceases.

8. (Currently Amended) The docking assembly as set forth in claim 7, further including:

an undock camming surface ~~(108, 110)~~ that communicates with the latch ~~(82)~~ to cam the latch ~~(82)~~ open when the motor ~~(154)~~ drives the drive shaft ~~(120, 134, 146)~~ in a second direction opposite the first direction.

9. (Currently Amended) The docking assembly as set forth in claim 1, further including:

an electronic controller ~~(200)~~ communicating with the actuator ~~(130, 154)~~ and the docking sensor ~~(160)~~, the electronic controller ~~(200)~~ operating the actuator ~~(130, 154)~~ to cooperate with the latch ~~(82)~~ to bias the movable subject couch ~~(30)~~ into the docked position in response to the docking sensor ~~(160)~~ detecting the movable subject couch ~~(30)~~ approaching the docked position.

10. (Currently Amended) The docking assembly as set forth in claim 9, wherein the electronic controller ~~(200)~~ monitors a state of the docking assembly, the docking assembly being in one of a plurality of states including:

a ready-to-dock state ~~(202)~~ in which the latch ~~(82)~~ is biased into a closed position and the electronic controller ~~(200)~~ is waiting for the docking sensor to detect the movable subject couch ~~(30)~~ approaching the docked position;

a docked state ~~(204, 206)~~ in which the latch ~~(82)~~ is biased into the closed position and secured to the connecting region ~~(50)~~ by the actuator ~~(130, 154)~~; and

an undocking state ~~(208)~~ in which the latch is biased into an open position by the actuator.

11. (Currently Amended) The docking assembly as set forth in claim 10, further including:

a tabletop lock sensor ~~(212)~~ that indicates a locked condition of a subject transfer pallet ~~(28)~~ of the movable subject couch ~~(30)~~, the electronic controller ~~(200)~~ monitoring the tabletop lock sensor ~~(212)~~ and prohibiting a docking assembly state transfer from the docked state ~~(204, 206)~~ to the undocking state ~~(208)~~ when the tabletop lock sensor ~~(212)~~ indicates an unlocked condition.

12. (Currently Amended) The docking assembly as set forth in claim 10, further including:

an actuator sensor ~~(164)~~ that indicates a position of the actuator ~~(130, 154)~~, the electronic controller ~~(200)~~ identifying the docking assembly state based on at least the docking sensor ~~(160)~~ and the actuator sensor ~~(164)~~.

13. (Currently Amended) A magnetic resonance imaging apparatus including:
a housing ~~(12)~~ that houses at least a main magnet and magnetic field gradient coils and defines a bore ~~(14)~~; and
the connecting region ~~(50)~~ of the docking assembly as set forth in claim 1 secured to the housing ~~(12)~~.

14. (Currently Amended) The magnetic resonance imaging apparatus as set forth in claim 13, wherein the connecting region ~~(50)~~ further includes:
a tongue ~~(60)~~ extending from the housing ~~(12)~~, the tongue ~~(60)~~ defining the imaging apparatus alignment surfaces ~~(64)~~; and
a latch block ~~(52)~~ disposed on the tongue, the latch ~~(82)~~ selectively latching onto the latch block ~~(52)~~.

14. (Currently Amended) A couch including:
a wheeled subject support ~~(30)~~; and
a docking assembly set forth in claim 1 for docking the wheeled subject support with a diagnostic imaging apparatus.

15. (Currently Amended) The couch as set forth in claim 14, wherein the actuator ~~(130, 154)~~ includes:
a motor ~~(154)~~ disposed on the movable subject support ~~(30)~~ that selectively drives the latch ~~(82)~~ to mate with the connecting region ~~(50)~~ of the imaging apparatus ~~(10)~~.

16. (Currently Amended) The couch as set forth in claim 15, wherein the actuator ~~(130, 154)~~ further includes:

a spring ~~(130)~~ disposed between the motor ~~(154)~~ and the latch ~~(82)~~, the spring ~~(130)~~ being mechanically loaded when the motor ~~(154)~~ drives the latch ~~(82)~~ to mate with the connecting region ~~(50)~~, the loaded spring biasing the latch ~~(82)~~ into the mated position when the motor ~~(154)~~ ceases the driving.

17. (Currently Amended) A method for docking a movable subject support couch ~~(30)~~ with an imaging apparatus ~~(10)~~, the method including:

moving the movable subject support couch ~~(30)~~ toward the imaging apparatus ~~(10)~~;
responsive to the moving, mating a latch ~~(82)~~ connected with the movable subject support couch ~~(30)~~ with a connecting region ~~(50)~~ of the imaging apparatus ~~(10)~~;
detecting the movable couch ~~(30)~~ approaching a docked position with respect to the imaging apparatus ~~(10)~~; and
responsive to the detecting, biasing the movable subject support couch ~~(30)~~ into the docked position using the mated latch ~~(82)~~ as a first force anchor.

18. (Currently Amended) The method as set forth in claim 17, further including:

locking a couch brake ~~(42)~~ after the movable couch ~~(30)~~ is biased into the docked position;
and
responsive to an unlocking of the couch brake ~~(42)~~, removing the biasing of the movable couch ~~(30)~~ into the docked position and unmating the latch ~~(82)~~ from the connecting region ~~(50)~~ of the imaging apparatus ~~(10)~~.

19. (Currently Amended) The method as set forth in claim 17, wherein the biasing of the movable subject support couch ~~(30)~~ into the docked position includes:

relatively drawing a second force anchor disposed on the movable couch ~~(30)~~ toward the first force anchor defined by the mated latch ~~(82)~~.